Peptide Functionalized Nanoparticles as Biomolecular Sensors

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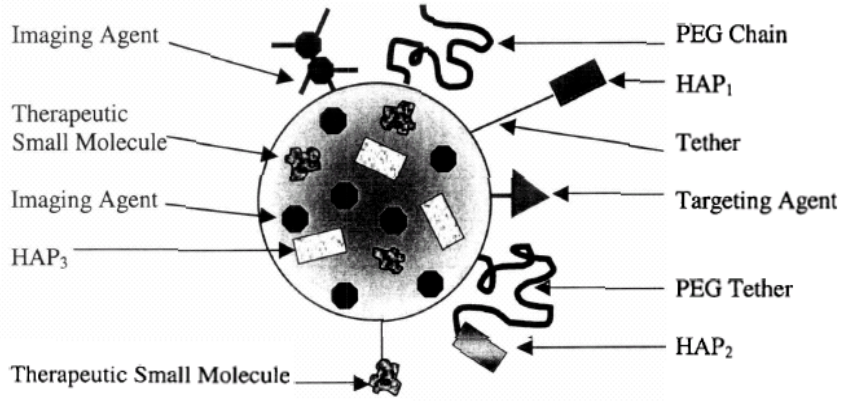
Biomolecular Systems Research Program



Description

1. Peptide Functionalized Nanoparticles (PFN) act as substrate/carrier
2. Carbohydrate or PEG nanoparticles are fabricated by self-assembly
3. Functionalized with surface ligands-imaging probes, targeting agents, etc.
4. High-throughput screening to identify peptides with improved binding to target molecules

Innovative Claims/NASA Significance

Fabrication of novel, unique biomolecular recognition materials that Alnis has termed peptide functionalized nanoparticles (PFNs) will detect signatures of cancer, disease-causing infectious agents, and other pathological conditions.

PFNs can be manufactured more easily and efficiently than humanized monoclonal antibodies and small molecule therapeutics.

The PFN-conjugates are capable of individual or combined delivery of imaging molecules, chemotherapeutic drug molecules, immunostimulants and other cancer therapeutics to the disease sites.

PFNs will allow multivalent receptor binding for enhanced efficacy,

Plans

Year 1

1. Develop peptide bead library for screening
2. Fabricate both PEG and carbohydrate nanoparticles

Year 2

1. Functionalize nanoparticles
2. In-vivo testing
3. Create phage library

Year 3

1. Imaging of functionalized nanoparticles
2. Addition of IL-2 to nanoparticles